

### **Amendments to the Claims:**

The following listing of the claims shall replace all previous versions thereof in this application.

### **Listing of the Claims:**

1. (Withdrawn) A method for defect localization, comprising: receiving a test structure that comprises at least one conductor and an electro-optically active material that is positioned such as to provide an indication about the electrical status of the at least one conductor; applying an electrical signal to the conductor; and imaging the test structure to locate a defect.
2. (Withdrawn) The method of claim 1, wherein the test structure is positioned on a wafer.
3. (Withdrawn) The method of claim 2, wherein the test structure is located on a scribe line or a die of the wafer.
4. (Withdrawn) The method of claim 1, wherein the step of imaging comprises illuminating the test structure with a polarized light.
5. (Withdrawn) The method of claim 1, further comprising reporting the location of the defect.
6. (Withdrawn) The method of claim 1, wherein the electro-optically active material is birefringent.
7. (Withdrawn) The method of claim 1, wherein the electro-optically active material is polymer.
8. (Withdrawn) The method of claim 1, wherein the electro-optically active layer is selected from the group consisting of: DAN [4-(N,N-dimethylamino)-3-acetamidomicrobenzene]; COANP [2-cyclo-octylanilino-5-nitropyridine]; PAN [4-N-pyrrolyldino-3-acetaminomicrobenzene]; and MBANP [2-(alpha-methylbenzylanilino)-5-nitropyridine].

9. (Withdrawn) The method of claim 1, wherein the electro-optically active material is a liquid crystal.

10. (Withdrawn) The method of claim 1, wherein electro-optically active material is disposed by spin-on, PVD, CVD or ALD.

11. (Withdrawn) The method of claim 1, wherein the electro-optically active material is disposed such as to have a thickness that is substantially equal to a width of at least one conductor.

12. (Withdrawn) The method of claim 1, wherein the electrical signal is a direct current (DC) voltage or current.

13. (Withdrawn) The method of claim 1, wherein the amplitude of the electrical signal is about 5 volts.

14. (Withdrawn) The method of claim 1, wherein the electrical signal is an alternating voltage or current.

15. (Withdrawn) The method of claim 14, wherein the step of imaging comprises: acquiring a first image of the test structure at a first phase of the electrical signal; and acquiring a second image at a second phase of the electrical signal.

16. (Withdrawn) The method of claim 15, wherein the step of imaging further comprises processing the first and second image to determine the location of the defect.

17. (Withdrawn) The method of claim 16, wherein the processing comprises providing a difference image between the first and second images.

18. (Withdrawn) The method of claim 15, wherein the electrical signal alternates at a frequency that ranges between 1-100 Hz.

19. (Withdrawn) The method of claim 1, wherein imaging the test structure further comprises imaging with sufficient resolution to detect defects comparable in size to a smallest dimension of a conductor of the test structure.

20. (Withdrawn) The method of claim 1, wherein imaging the test structure further comprises selecting resolution based on a dimension of at least one conductor.

21. (Withdrawn) The method of claim 1, wherein the test structure further comprises a non-opaque conductive material positioned above the electro-optically active material.

22. (Withdrawn) The method of claim 21, wherein the non-opaque conductive layer is electrically grounded.

23. (Withdrawn) The method of claim 1, wherein the step of receiving a test structure is preceded by the steps of: inspecting the test structure before the conductor is at least partially covered by an electro-optically active material; and analyzing the test structure to provide a first analysis result.

24. (Withdrawn) The method of claim 1, further comprising performing a probe-based analysis of the test structure.

25. (Withdrawn) The method of claim 1 wherein the electrical signal charges at least a portion of the conductor.

26. (Currently Amended) A system for defect localization in a test structure, comprising:  
a stage ~~for configured to support and position~~ supporting and positioning the test structure within the system;

means for illuminating an electro-optically active material layer, wherein (i) the electro-optically active layer coats only a top surface of the test structure, (ii) said test structure including includes a conductor, and (iii) the electro-optically active layer material of the test structure positioned so as to provide provides an indication about an electrical status of the conductor;

a detector ~~for detecting~~ configured to detect light scattered or reflected from the electro-optically active ~~layer material of the test structure;~~

means for providing an alternating current electrical signal coupled to the conductor of the test structure, said alternating current electrical signal characterized by multiple phases and said means for providing further configured to synchronize phases of the alternating current electrical signal with image captures of the test structure; and

a processor ~~for generating~~ configured to (i) generate a first image of the test structure during a first phase of the electrical signal based on detection signals received from the detector, ~~generating (ii) generate~~ a second image of the test structure during a second phase of the electrical signal based on detection signals received from the detector, and ~~processing (iii) process~~ the first and second images in order to locate a defect in the test structure.

27. (Original) The system of claim 26, wherein the means for illuminating illuminates the test structure with a polarized light.

28. (Original) The system of claim 26, further adapted to report the location of the defect.

29. (Cancelled)

30. (Currently Amended) The system of claim 26, wherein ~~the an~~ amplitude of the electrical signal is about 5 volts.

31 - 33. (Cancelled)

34. (Currently Amended) The system of claim 26, wherein the processor is ~~adapted further~~ configured to generate a difference image between the first and second images.

35. (Previously Presented) The system of claim 26, wherein the electrical signal alternates at a frequency that ranges between 1-100 Hz.

36. (Currently Amended) The system of claim 26, wherein the system is adapted to image the test structure with sufficient resolution to detect defects comparable in size to a smallest dimension of ~~a~~the conductor of the test structure.

37 - 44. (Cancelled)